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AUG 24 1981

Docket Nos.: STN 50-454
and STN 50-455

Mr. Louis O. DelGeorge
Director of Nuclear Licensing
Commonwealth Edison Company
P. O. Box 767
Chicago, Illinois 60690

Dear Mr. DelGeorge:

Subject: Request for Additional Information for the Review of the Byron Plant, Units 1 & 2 - Regarding Chemical Engineering

As a result of our continuing review of the Byron Plant, Units 1 and 2 FSAR, we find that we need additional information to complete our evaluation. The specific information required is in the area of chemical engineering and is presented in the Enclosure.

To maintain our licensing review schedule for the Byron Plant FSAR, we will need responses to the enclosed request by September 30, 1981. If you cannot meet this date, please inform us within seven days after receipt of this letter of the date you plan to submit your responses so that we may review our schedule for any necessary changes.

Please contact J. C. Snell, Byron Licensing Project Manager, if you desire any discussion or clarification of the enclosed report.

Sincerely,

Original signed by:
B. J. Youngblood

B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing

Enclosure:
As stated

cc: See next page

OFFICE	DL:LB#1	DL:LB#1					
SURNAME	JCSnell/lg	BJYoungblood					
DATE	8/20/81	8/21/81					

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ENCLOSURE

CHEMICAL ENGINEERING
BYRON NUCLEAR STATION UNITS NO. 1 AND 2
DOCKET NO. 50-454/455

281.1 (6.1.1) (6.5.2) Describe the containment sump design features to insure that adequate solution mixing of ESF fluids will occur and proper sump chemistry will be maintained. Allowance should be made for "dead" volumes, sumps, etc., in the determination of sump pH and the quantitites of NaOH used to verify that no areas accumulate spray solutions with pH less than 7.0.

281.2 (6.1.2) (a) Verify that the coatings on the steel containment, concrete wall, and concrete floors described in pages 6.1-4 and 6.1-5 of your FSAR meet the requirements of ANSI 101.2 and Regulatory Guide 1.54 or meet the requirements of ANSI 101.2 and the alternative QA acceptance criteria for protective coatings described on page 6.1-7 of your FSAR.

(b) State whether the equipment coating described on page 6.1-6 and listed in Table 6.1-2 of your FSAR meets either one of the above criteria specified for the containment and floor coating. In addition, provide the thickness for the coatings listed in Table 6.1-2 of your FSAR.

(c) In order for the staff to estimate the rate of combustible gas generation vs time becasue of exposure of organic cable insulation to DBA condition inside containment, provide the following information: (1) the quantity (weight and volume) of uncovered cable and cable in closed metal conduit or closed cable trays. We will give credit for beta radiation sheilding for that portion of cable that is indicated to be in closed conduit or trays. (2) A breakdown of cable diameters and associated conductor cross sections, or an equivalent cable diameter and conductor cross section that is representative of total cable surface area associated with the quantity of cable identified in 1) above. (3) The major organic polymer or plastic material in the cables. If this information is not provided, we will assume the cable insulation to be polyethylene and assume a G value for combustible gas of 3.

5. Verify that valves which are not accessible for repair after an accident are environmentally qualified for the conditions in which they must operate.

6. Provide a procedure for relating radionuclide gaseous and ionic species to estimated core damage.

7. State the design or operational provisions to prevent high pressure carrier gas from entering the reactor coolant system from on line gas analysis equipment, if it is used.

8. Provide a method for verifying that reactor coolant dissolved oxygen is at < 0.1 ppm if reactor coolant chlorides are determiend to be 0.15 ppm.

9. Provide information on (a) testing frequency and type of testing to ensure long term operability of the post accident sampling system and (b) operator training requirements for post-accident sampling.

10. Demonstrate that the reactor coolant system and suppression chamber sample locations are representative of core conditions.

In addition to the above licensing conditions the staff is conducting a generic review of accuracy and sensitivity for analytical procedures and on-line instrumentation to be used for post-accident analysis. We will require that the applicant submit data supporting the applicability of each selected analytical chemistry procedure or on-line instrument along with documentation demonstrating compliance with the licensing conditions four months prior to exceeding 5% power operation, but review and approval of these procedures will not be a condition for full power operation. In the event our generic review determines a specific procedure is unacceptable, we will require the applicant to make modifications as determined by our generic review.

281.3 (9.1.3) Describe the samples and instrument readings and the frequency of measurement that will be performed to monitor the water purity and need for spent fuel pit cleanup system demineralizer resin and filter replacement. State the chemical and radiochemical limits to be used in monitoring the spent fuel pool water and initiating corrective actions. Provide the basis for establishing these limits. Your response should consider variables such as: boron, gross gamma and iodine activity, demineralizer and/or filter differential pressure, demineralizer contamination factor, pH, and crud level.

281.4 (9.3.2) Your FSAR did not indicate that the refueling water storage tank, the boric acid mixing tank, the chemical additive tank, and the sump tank will be sampled. Confirm that these tanks will be sampled according to Standard Review Plan 9.3.2.

281.5 (9.3.2) Verify that sample line purge flows and duration times are sufficient to flush out stagnant lines to assure that a representative sample is obtained. (The NSSS vendor recommends a flush of 6-10 sample line volumes, at a purge flush rate of about 2-3 times the sample flow rates).

281.6 (9.3.2) Describe how discharge flows are limited under normal and anticipated fault conditions (malfunction or failure) to preclude any fission product release beyond the plant release limitation given in the Technical Specification. Installation of an orifice or a fully qualified solenoid valve which will provide a remote sampling system isolation capability is acceptable.

281.7 (TMI II.B.3) Provide information that satisfies the attached proposed license conditions for post-accident sampling.

281.8 (9.3.4) Describe provisions for monitoring filter/demineralizer differential pressure to assure that pressure differential limits are not exceeded (Section II.8.b. of Standard Review Plan 9.3.4)

NUREG-0737, II.B.3 - Post Accident Sampling Capability

REQUIREMENT

Provide a capability to obtain and quantitatively analyze reactor coolant and containment atmosphere samples, without radiation exposure to any individual exceeding 5 rem to the whole body or 75 rem to the extremities (GDC-19) during and following an accident in which there is core degradation. Materials to be analyzed and quantified include certain radionuclides that are indicators of severity of core damage (e.g., noble gases, iodines, cesiums and non volatile isotopes), hydrogen in the containment atmosphere and total dissolved gases or hydrogen, boron and chloride in reactor coolant samples in accordance with the requirements of NUREG-0737.

To satisfy the requirements, the application should (1) review and modify his sampling, chemical analysis and radionuclide determination capabilities as necessary to comply with NUREG-0737, II.B.3, (2) provide the staff with information pertaining to system design, analytical capabilities and procedures in sufficient detail to demonstrate that the requirements have been met.

EVALUATION AND FINDINGS

The applicant has committed to a post-accident sampling system that meets the requirements of NUREG-0737, Item II.B.3 in Amendment , but has not provided the technical information required by NUREG-0737 for our evaluation. Implementation of the requirement is not necessary prior to low power operation because only small quantities of radionuclide inventory will exist in the reactor coolant system and therefore will not affect the health and safety of the public. Prior to exceeding 5% power operation the applicant must demonstrate the capability to promptly obtain reactor coolant samples in the event of an accident in which there is core damage consistent with the conditions stated below.

1. Demonstrate compliance with all requirements of NUREG-0737, II.B.3, for sampling, chemical and radionuclide analysis capability, under accident conditions.

2. Provide sufficient shielding to meet the requirements of GDC-19, assuming Reg. Guide 1.4 source terms.

3. Commit to meet the sampling and analysis requirements of Reg. Guide 1.97, Rev. 2.

4. Verify that all electrically powered components associated with post accident sampling are capable of being supplied with power and operated, within thirty minutes of an accident in which there is core degradation, assuming loss of off site power.